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08/522,085 08/31/95 TANAKA

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A	219742/41897
EXAMINER	
TUNG, T	
ART UNIT	PAPER NUMBER

1102

DATE MAILED:

03/21/96

This is a communication from the examiner in charge of your application
COMMISSIONER OF PATENTS AND TRADEMARKS☒ This application has been examined ☐ Responsive to communication filed on _____ ☐ This action is made final.A shortened statutory period for response to this action is set to expire 3 month(s), _____ days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133**Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:**

- | | |
|---|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited by Examiner, PTO-892. | 2. <input checked="" type="checkbox"/> Notice of Draftsman's Patent Drawing Review, PTO-948. |
| 3. <input type="checkbox"/> Notice of Art Cited by Applicant, PTO-1449. | 4. <input type="checkbox"/> Notice of Informal Patent Application, PTO-152. |
| 5. <input type="checkbox"/> Information on How to Effect Drawing Changes, PTO-1474. | 6. <input type="checkbox"/> _____ |

Part II SUMMARY OF ACTION

1. ☒ Claims 1-17 are pending in the application.
Of the above, claims _____ are withdrawn from consideration.
2. ☐ Claims _____ have been cancelled.
3. ☐ Claims _____ are allowed.
4. ☒ Claims 1-17 are rejected.
5. ☐ Claims _____ are objected to.
6. ☐ Claims _____ are subject to restriction or election requirement.
7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.
8. ☐ Formal drawings are required in response to this Office action.
9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).
10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____, has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).
11. ☐ The proposed drawing correction, filed _____, has been ☐ approved; ☐ disapproved (see explanation).
12. ☒ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☒ been received ☐ not been received
☐ been filed in parent application, serial no. _____; filed on _____.
13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.
14. ☐ Other

EXAMINER'S ACTION

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The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4 are rejected under 35 U.S.C. § 102(b) as being anticipated by Csanitz etl.

Csanitz discloses a heater 24 disposed within a solid electrolyte element. A layer of alumina 39 is located between the heater and the internal electrode of the solid electrolyte and can be said to be on the electrode's surface. See col. 3, line 14 to col. 4, line 27.

Claims 1-3 are seen to be clearly met. As for claim 4, since the layer comprises granules, its surface roughness is presumably more than 1 micron.

The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention

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were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

Claim 5 is rejected under 35 U.S.C. § 103 as being unpatentable over Csanitz et al alone or in view of Agarwal et al.

This claim differs from Csanitz by calling for the heater to have a polygonal cross-section.

Whether a heater is cylindrical or polygonal is a matter of design choice in the absence of unexpected results. The substitution of art-recognized equivalents is within the skill of the art. In any event, Agarwal appears to show heater elements that are polygonal. ^{See fig. 1 and col. 2, l. 23.} It would be obvious for Csanitz to adopt a polygonal heater in the absence of unexpected result.

Claim 4 is rejected under 35 U.S.C. § 103 as being unpatentable over Csanitz et al.

If layer 39 of Csanitz does not have a surface roughness of at least 1 micron, applicant's claim differs in that respect.

It would be obvious for Csanitz to adopt a surface roughness of at least 1 micron, since that is a mere matter of design choice.

Claims 1-8 are rejected under 35 U.S.C. § 103 as being unpatentable over Togawa et al in view of Sakurai et al.

Togawa discloses a solid electrolyte element with an internal electrode 14, which may be of SiC. See col. 3, line 51

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to col. 4, line 16. Applicant's claims differ by calling for a heater to be disposed within the electrolyte element.

Sakurai disclose the well-known expedient of locating a heater within the electrolyte element. See col. 3, line 47. The solid electrolyte sensor will not function at low, unheated temperatures. Thus a heating element is always needed. Externally located heaters may be cumbersome in construction or being too remote from the electrolyte element. Thus, it would be obvious for Togawa to incorporate a heater within the electrolyte, as shown by Sakurai.

Claim 5 is rejected under 35 U.S.C. § 103 as being unpatentable over Togawa et al in view of Sakurai et al and Agarwal et al.

This claim further differs by calling for a heater with a polygonal cross-section. As discussed before, it would be obvious to change the Sakurai heater to one with a polygonal cross-section in the absence of unexpected result.

Claims 1-5, 9-11 are rejected under 35 U.S.C. § 103 as being unpatentable over Sakurai et al in view of Agarwal et al.

Sakurai, as discussed before, discloses a heater located with a solid electrolyte element. See col. 3, line 47. Applicant's claims differ from Sakurai by calling for the heater to be made of nitrides of silicon and aluminum.

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Agarwal discloses AlN and SiN to be known materials for heaters. See col. 4, lines 10-19. It would be obvious for Sakurai to adopt a nitride heater, since the substitution of art-recognized equivalents is within the skill of the art.

Claims 1-8, 12-15 are rejected under 35 U.S.C. § 103 as being unpatentable over Sukurai et al in view of Hackh's.

Sakurai has been previously discussed. Applicant's claims differ by calling for the internal electrode to have a higher emissivity than that of the external electrode. A specific material recited for the internal electrode is platinum black.

Hackh's discloses platinum black to be a particularly active catalyst form of platinum. See page 529. It would be obvious to use the platinum black form of platinum for the platinum internal electrode of Sakurai, since Sakurai desires an electrode with high catalytic activity. See col. 3, line 40.

Claim 5 is rejected under 35 U.S.C. § 103 as being unpatentable over Sakurai et al in view of Hackh's and Agarwal et al.

This claim further differs by calling for a polygonal heater cross section. As discussed before, Agarwal renders that obvious.

Claims 16, 17 are rejected under 35 U.S.C. § 103 as being unpatentable over Sakurai et al in view of Hackh's and Topp et al.

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These claims differ further by calling for an outermost layer to be of a material having a lower emissivity than that of the internal electrode.

Topp discloses an outermost layer 6 on a sensor made of such materials as kaolin and feldspar. See col. 8, line 35. It would be obvious for Sakurai to adopt the outer layer of Topp to protect its external electrode from the harsh environment.

Claims 1-8, 12-17 are rejected under 35 U.S.C. § 103 as being unpatentable over Matsumoto et al in view of Sakurai et al.

Matsumoto discloses a solid electrolyte with an internal electrode comprising oxides of Ni, Cu, Co and Fe, all of which are set forth by applicant as high emissivity material. See col. 3, line 40. Applicant's claims differ by calling for a heater to be located within the solid electrolyte element.

As discussed before, Sakurai discloses a heater within a solid electrolyte element. It would be obvious for Matsumoto to incorporate an internal heater, since an external heater can be cumbersome and too remote.

As for claims 16 and 17, the oxides of the internal electrode presumably have a higher emissivity than the outer coating 3 of Matsumoto.

Claim 5 is rejected under 35 U.S.C. § 103 as being unpatentable over Matsumoto et al in view of Sakurai et al and Agarwal et al.

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This claim further differs by calling for a polygonal heater cross-section. As discussed before, that is rendered obvious by Agarwal.

Claims 1-5 are rejected under 35 U.S.C. § 103 as being unpatentable over Bode in view of Sakurai et al.

Bode discloses a layer 9 over an internal electrode of a solid electrolyte element that can be an oxide of Zr, Al, Ti and Y. Applicant sets forth these oxides to have high emissivity. Applicant's claims differ by calling for an internal heater in the electrolyte element. See col. 4, lines 4-20.

As discussed before, Sakurai renders an internal heater to be obvious.

Claim 5 is rejected under 35 U.S.C. § 103 as being unpatentable over Bode in view of Sakurai et al and Agarwal et al.

This claims further differs by calling for a polygonal heater cross-section. As discussed before, Agarwal renders that to be obvious.

Claims 6-17 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6, line 3, "electrodes" should be singular. Claim 9, lines 8 and 9, silicon nitride is stated twice. Claim 11, line 2, "said material..." has no antecedent. Claim 12, line 9, "high

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emissivity" without numerical limits is vague. Claim 13, line 3, "and" is questioned. Does applicant intend the electrode to contain both materials simultaneously? Claim 14, line 2, "said surface..." has no antecedent, and line 3, "to" should be cancelled. Claim 16, line 8, "said surface..." has no antecedent. Claim 16, line 9, "high emissivity" without numerical limits is vague.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ta Tung whose telephone number is (703) 308-3329. The examiner can normally be reached on Monday through Friday from 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. John Niebling, can be reached on (703) 308-3325. The fax phone number for this Group is (703) 305-3600.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0661.


Ta Tung
Primary Examiner
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Ta Tung
March 13, 1996